What is claimed is:

1.   An image processing apparatus comprising:

an orthogonal transform section that is configured to transform a block multi-bit image of a predetermined size into orthogonal transform coefficients corresponding to spatial frequencies that the block multi-bit image has;

a quantizing section that is configured to quantize the orthogonal transform coefficients for each spatial frequency to obtain quantized data composed of a predetermined number of bits;

a banding section that is configured to rearrange the quantized data obtained in said quantizing section for each spatial frequency to generate bit serial data that the quantized data of a same spatial frequency band exists successively over adjacent blocks; and

a coding section that is configured to compress the bit serial data.

2.   The image processing apparatus according to claim 1, further comprising:

an editing section that is configured to perform image editing on the quantized data obtained in said quantizing section for each block,

wherein said banding section rearranges the edited quantized data for each spatial frequency.

3.   The image processing apparatus according to claim 1, further comprising:

a decompressing section that is configured to decompress the data compressed in said coding section;

a frequency component decoding section that is configured to decode quantized data of each spatial
5 frequency component from decompressed bit serial data for each block;

an inverse quantizing section that is configured to perform inverse quantization on the decoded quantized data of each spatial frequency component to decompress
10 the orthogonal transform coefficients;

an inverse orthogonal transform section that is configured to restore an original block image from the decompressed orthogonal transform coefficients; and

a block combining section that is configured to
15 combine the restored block image to generate original multi-bit image data.

4. The image processing apparatus according to claim 3, wherein said editing section controls a write address or a read address of a memory in which the quantized data
20 is written corresponding to rotation control data indicative of a rotation amount and rotation direction of an image to rotate an arrangement of the image for each block, and

said block combining section controls a write
25 address or a read address of a memory in which the restored block image is written corresponding to the rotation control data to rotate an image in the block for each

block.

5.   The image processing apparatus according to claim 4, further comprising:

an information adding section that is configured to add rotation information indicative of contents of rotation control for each page to the bit serial data of the image rotated in said editing section; and

an information detecting section that is configured to detect the rotation information from the decoded bit serial data, wherein said block combining section controls rotation of the image in the block corresponding to the rotation information detected in said information detecting section.

6.   The image processing apparatus according to claim 3, wherein said coding section codes image data according to a facsimile coding standards, and

said decoding section decodes the image data according to a facsimile decoding system correspond to the facsimile coding standards.

7.   The image processing apparatus according to claim 3, further comprising:

a half-tone processing section that is configured to perform half-tone processing on the multi-bit image data to obtain half-tone data; and

a function selecting section selects the half-tone data or the bit serial data to input to said coding section

corresponding to a function selecting signal for instructing an copy operation or facsimile transmission, wherein when the facsimile transmission is selected, said apparatus outputs the coded data to an outside.

5　　8.　A multifunctional apparatus comprising:

an image inputting section that is configured to scan an original and to input image data;

the image processing apparatus according to claim 3;

10　　a printing section that is configured to print an image restored in said image processing apparatus; and

a communication section that is configured to transmit by facsimile an image on which facsimile transmission is instructed among images compressed in

15　said image processing apparatus.

9.　A coding method of image data, comprising:

transforming a block multi-bit image of a predetermined size into orthogonal transform coefficients corresponding to spatial frequencies that

20　the block multi-bit image has;

quantizing the orthogonal transform coefficients for each spatial frequency to obtain quantified data composed of a predetermined number of bits;

rearranging the quantized data obtained for each

25　spatial frequency to generate bit serial data that the quantized data of a same spatial frequency band exists successively over adjacent blocks; and

compressing the bit serial data.

10. An image processing method, comprising:

transforming a block multi-bit image of a predetermined size into orthogonal transform coefficients corresponding to spatial frequencies that the block multi-bit image has;

quantizing the orthogonal transform coefficients for each spatial frequency to obtain quantified data composed of a predetermined number of bits;

rearranging the quantized data obtained for each spatial frequency to generate bit serial data that the quantized data of a same spatial frequency band exists successively over adjacent blocks;

compressing the bit serial data to store in a memory;

reading compressed data from said memory to decompress;

decoding quantized data of each spatial frequency component from decompressed bit serial data for each block;

performing inverse quantization on the decoded quantized data of each spatial frequency component to decompress the orthogonal transform coefficients;

restoring an original block image from the decompressed orthogonal transform coefficients; and

combining the restored block image to restore original multi-bit image data.